

# Continuity of Care Practices and Substance Use Disorder Patients' Engagement in Continuing Care

Jeanne A. Schaefer, PhD,\*† Erin Ingudomnukul, BA,\*† Alex H. S. Harris, PhD,\*†‡ and Ruth C. Cronkite, PhD,\*§

**Background:** Substance use disorder (SUD) patients who engage in more continuing care have better outcomes, but information on practices associated with greater patient engagement and retention in continuing care remains elusive.

**Objectives:** The objectives of this study were to determine if staff's continuity of care practices predict patients' engagement in continuing care in the 6 months after discharge from intensive SUD treatment and to determine if the impact of continuity of care practices on patients' engagement in continuing care differs for patients treated in inpatient/residential versus outpatient programs.

**Research Design:** Staff in 28 Veterans Affairs (VA) intensive SUD treatment programs with varying continuity of care practices provided data on 878 patients' alcohol and drug problems at treatment entry. At discharge, staff provided data on patients' motivation, treatment intensity, and on the continuity of care practices they used with each patient. VA administrative databases supplied data on patients' subsequent engagement in continuing care. Mixed-effects modeling was used to examine predictors of patients' engagement in care.

**Results:** Patients in outpatient programs who received more continuity of care engaged in continuing care significantly longer. More highly motivated outpatients, those with fewer alcohol problems at treatment entry, and patients who used VA services in the year before treatment also remained in continuing care longer. These findings did not hold for patients treated in inpatient/residential programs.

**Conclusions:** Continuity of care practices predicted engagement in continuing care only for patients treated in outpatient SUD programs. More research is needed to identify effective continuity of care practices for patients treated in inpatient/residential programs.

**Key Words:** continuity of care, substance abuse, outcomes, coordinated care, health services research

(*Med Care* 2005;43: 1234–1241)

The Department of Veterans Affairs (VA) clinical practice guidelines for substance use disorder (SUD) treatment<sup>1</sup> and the American Psychiatric Association's<sup>2</sup> practice guidelines support the value of continuing outpatient care after intensive treatment. A growing body of evidence suggests that substance use disorder (SUD) patients who engage in more continuing outpatient care have better symptom and functioning outcomes.<sup>3–12</sup> In addition, VA nationwide treatment evaluations have shown that continuing care of longer duration (2 visits per month over 6 months or more) is linked to increased abstinence from drugs and alcohol, fewer substance use problems, lower arrest rates at 1-year follow-up,<sup>8,9</sup> and greater likelihood of remission at 2-year follow-up.<sup>10</sup> However, among VA SUD patients nationally in 2002, only 33% of those treated in inpatient SUD programs and 44% of patients treated in outpatient clinics had 2 or more outpatient mental health visits within 30 days of discharge.<sup>13</sup> In an effort to enhance participation in continuing care, the VA recently adopted a new performance measure for SUD programs<sup>14</sup> to increase the percentage of patients who maintain continuous involvement in treatment of 90 days after a new episode of specialty SUD treatment.

Although continuing care is considered crucial to sustaining treatment gains and preventing relapse,<sup>15</sup> research on continuity of care practices that enhance patients' engagement and retention in continuing care, especially after outpatient treatment, is limited.<sup>12</sup> In this study, we define continuity of care practices as services provided to patients during intensive treatment and after discharge such as sending appointment reminders. In a series of intervention studies at one VA SUD treatment program, patients participated in more continuing care when they were provided continuing care orientation sessions,<sup>16</sup> appointment letters, reminder phone calls, feedback on session attendance,<sup>17</sup> and social reinforcement (eg, certificates or medallions for completing sessions).<sup>18</sup> Patients who received a standard continuing care orientation and social reinforcement for continuing care group therapy participation also were more likely to be

From the \*Center for Health Care Evaluation and the †Program Evaluation and Resource Center, Department of Veterans Affairs Health Care System, Palo Alto, California; and the Departments of ‡Psychiatry and Behavioral Sciences and §Sociology, Stanford University, Stanford, California.

Supported by the Department of Veterans Affairs Health Services Research and Development Service and the Mental Health Strategic Healthcare Group and conducted under the auspices of the Veterans Affairs Quality Enhancement Research Initiative Substance Use Disorder Module grant SUS99027-01.

The views expressed here are the authors' and do not necessarily represent the views of the Department of Veterans Affairs.

Reprints: Jeanne A. Schaefer, PhD, Author Center for Health Care Evaluation, VA Palo Alto Health Care System, 795 Willow Road (152), Menlo Park, CA 94025. E-mail: Jeanne.Schaefer@med.va.gov.

Copyright © 2005 by Lippincott Williams & Wilkins  
ISSN: 0025-7079/05/4312-1234

abstinent at 6-month follow-up than patients who only received standard continuing care orientation.<sup>19</sup>

In this study, we use data from a multisite study of continuity of care practices in intensive VA SUD treatment programs to examine the relationship between specific practices and patients' engagement in continuing care. We focus on key continuity of care practice dimensions identified from the literature, including staff efforts to maintain continuity in providers across levels of care, coordinate and share information among providers, link patients with community resources, and stay in contact with patients and monitor their progress.<sup>20–23</sup> We also examine the effect of program type on patients' engagement in continuing care because recent research suggests that program type contributes to variability in continuity of care practices. For example, inpatient/residential program staff provide less coordinated care to SUD patients and make fewer efforts to maintain contact with them than outpatient program staff.<sup>24</sup>

The aims of this study are 2-fold: 1) to determine whether the continuity of care practices that SUD treatment staff use predict the length of patients' engagement in continuing outpatient care during the 6 months after discharge from intensive treatment, and 2) to characterize differences in the impact of continuity of care practices on engagement in continuing care for patients treated in inpatient/residential SUD treatment programs versus outpatient programs.

## METHOD

Directors of 129 VA intensive SUD treatment programs provided data regarding their programs' continuity of care practices by completing the Continuity of Care Practices Survey (CCPS-P)<sup>24</sup> either by telephone interview or mailed questionnaire. The CCPS-P assesses 4 continuity of care practices dimensions at the program level, including provider efforts to: 1) ensure continuity in providers, 2) maintain contact with patients, 3) connect patients to community resources, and 4) coordinate care. Intensive outpatient programs provided treatment 3 or more hours per day for 3 or more days per week; intensive inpatient/residential programs offered a minimum of 14 days of treatment.

Based on power calculations, we recruited a representative subsample of 28 of the 129 SUD programs varying on type of treatment (inpatient/residential or outpatient) and program-level continuity of care practices. Staff at the 28 programs obtained data on 878 patients' sociodemographic characteristics and drug and alcohol problems at entry to treatment using the Addiction Severity Index (ASI).<sup>25</sup> At discharge, counselors/case managers completed the individual-level Continuity of Care Practices Survey (CCPS-I)<sup>23</sup> for an average of 30 newly admitted patients per program ( $n = 835$  or 95% of 878 patients with baseline data). The CCPS-I has dimensions parallel to the CCPS-P and assesses the specific continuity of care practices counselors/case managers used or expected to use with individual patients during the transition from intensive SUD treatment to continuing care. Counselors/case managers also supplied data at discharge on each patient's treatment intensity and completion and motivation. The VA's National Patient Care Database (NPCD)

provided data on patients' engagement in continuing outpatient care, diagnoses, and service codes and dates.

## Program and Patient Samples

The *program sample* comprised 10 VA inpatient/residential SUD programs and 18 outpatient programs (intensive outpatient and day treatment programs); methadone maintenance programs were excluded. Inpatient/residential programs had a median length of stay of 22 days. Among outpatient programs, the median length of stay was 21 days; the median level of services was 5 days per week and 6 hours per day, or an average of 30 hours of treatment per week. For inpatient/residential programs, the average number of patients treated annually per full-time staff member was 26; for outpatient programs, it was 70. Outpatient programs treated more patients per year (median = 466) than did inpatient/residential programs (median = 356).

The *patient sample* included 878 consecutively admitted patients from inpatient/residential ( $n = 298$ ) and outpatient programs ( $n = 580$ ) with an International Classification of Diseases, 9th Revision, Clinical Modification<sup>26</sup> diagnosis for SUD who had not been admitted to a VA intensive SUD treatment program in the 30 days before admission. Almost all patients were men (98%) and 48% were nonwhite. On average, patients were 47 (standard deviation [SD] = 8.0) years old and had 13 (SD = 2.0) years of education. Over half of the patients (59%) were divorced or separated; 19% were married and 22% were never married or widowed. Approximately two-thirds of patients (64%) had only a SUD diagnosis; the rest were dually diagnosed with a psychiatric disorder. The majority of patients (72%) had both an alcohol and drug use disorder; 19% had only alcohol diagnoses and 8% had only drug diagnoses. Most patients (79%) received VA psychiatric or SUD services in the year before their intensive SUD treatment admission.

## Measures

### Patient and Treatment Factors

ASI interviews at treatment entry provided data on patients' demographic characteristics: age, years of education, marital status, and ethnicity, as well as composite scores for drug and alcohol problems. The NPCD provided information on whether patients had both SUD and psychiatric diagnoses (yes/no) or used VA outpatient SUD or psychiatric services in the year before treatment entry (yes/no).

At discharge, counselors/case managers provided data on whether patients completed treatment (yes/no) and treatment intensity (average number of sessions per day, ie, training [eg, psychoeducation, stress management], vocational/rehabilitation, informal sessions [eg, self-help, peer counseling], and formal therapy). Staff also assessed patients' motivation at discharge using a scale ( $\alpha = 0.95$ ) developed for this study. The scale score is the mean response to 5 items on a 4-point scale that varied from "not at all" to "extremely" such as how hard the patient was working to cut down on drinking and/or drug use, how committed the patient was to maintaining changes made during treatment, and how motivated the patient was to participate in continuing care.

## Continuity of Care Practices

Data on the continuity of care practices counselors/case managers used with patients were obtained from 4 CCPS-I subscales.<sup>24</sup> *Provider continuity* (alpha = 0.35)—the sum of responses to 2 yes/no items that ask: 1) “Will most of this patient’s continuing outpatient care be provided in your program by the same person who served as the patient’s primary counselor/case manager during intensive SUD treatment?” and 2) “Do you expect that this patient will be assigned to the same counselor, case manager, or addictions treatment team in your program if he or she relapses and needs intensive SUD treatment again?” *Maintain contact* (alpha = 0.82)—the sum to 4 items rated on a 4-point scale varying from “not very likely” (0) to “extremely likely” (3) such as how likely it is that staff will: make reasonable attempts to contact the patient within 3 working days of a missed continuing care outpatient appointment, send an appointment reminder before scheduled outpatient appointments, or call the patient within 14 days of discharge to find out if he or she has contacted services to which he or she has been referred. *Connect to resources* (alpha = 0.67)—the sum of 7 dichotomous items: 6 yes/no items such as whether staff, before the patient’s discharge from intensive treatment, arranged for the patient to meet or talk to the counselor who would be providing him or her with continuing outpatient care, arranged for the patient to attend an Alcoholics Anonymous, Narcotics Anonymous, or Cocaine Anonymous meeting in his or her community during intensive treatment or secured drug-free or sober living arrangements for the patient, and a seventh item, dichotomized as above or below the mean score for 6 referral actions taken by staff to address the patient’s coexisting problems (eg, medical, employment, housing, family). These items were rated on a 4-point scale ranging from “1” “left it up to the patient to refer him- or herself to an appropriate program” to “4” “set up an appointment for this patient with a specific staff person at the program.” *Coordinate care* (alpha = 0.84)—the sum of 5 yes/no items such as whether staff, before discharge from intensive treatment, notified the outpatient counselor of the patient’s impending discharge, worked with outpatient counselors to jointly develop the patient’s discharge plan, or checked with counselors to make sure the patient was keeping continuing care appointments. For more information on the psychometric properties of the CCPS-I, see Schaefer et al.<sup>24</sup>

## Engagement in Continuing Care

Data from the NPCD were used to assess engagement in continuing care, ie, the total number of consecutive months (0–6) after intensive treatment in which a patient had 2 or more SUD or psychiatric continuing care clinic visits and no inpatient SUD or psychiatric readmissions. For example, a patient who made 2 continuing care visits per month for 2 months, was readmitted in the third month or did not have any continuing care visits during the third month received an engagement score of 2.

We focused on consistent engagement in continuing care as an outcome because of its clinical relevance. Two visits per month are closely aligned with the VA’s continuity

of care performance measure. Moreover, research evidence<sup>8–10</sup> suggests that having at least 2 mental health visits per month for each of 6 months is linked to better symptom and functioning outcomes among SUD patients.

## Statistical Analyses

Using independent group *t* tests, we first examined whether the subgroup of inpatient/residential patients differed from the outpatient subgroup on demographic and clinical characteristics, treatment factors, continuity of care practices received, and engagement in continuing care. We also examined correlations between key predictor variables (4 CCPS-I subscales) and engagement.

## Mixed-Effects Regression Models

To examine the overall impact of continuity of care practices on engagement in care, and to account for the lack of data independence for patients within SUD programs, Poisson mixed-effects regression analyses were conducted using the glmmPQL function in R.<sup>27,28</sup>

We conducted separate analyses for individuals in inpatient/residential and outpatient programs. In each analysis, the dependent variable was the number of consecutive months each patient engaged in continuing care and was not readmitted. Predictor variables included each patient’s demographic and clinical characteristics, treatment factors, and 1 of the 4 CCPS-I subscales scores: coordinate care, connect to resources, maintain contact, and provider continuity. To address multicollinearity problems, we estimated separate models for each CCPS-I subscale.

## Bonferroni Correction

Given the number of parameters estimated, we used more restrictive criteria for estimating statistical significance. The alpha level was set at  $P \leq 0.003$  (0.05/16) for the independent group *t* tests,  $P \leq 0.005$  (0.05/10) for the correlations, and at  $P \leq 0.01$  (0.05/4) for the multilevel analyses.

## Missing Data

Usual methods of handling missing data (eg, dropping cases with missing data on just one variable or mean imputation) have been shown to introduce serious bias to analyses.<sup>29,30</sup> Although the percent of patients with missing discharge data was only 5%, approximately 20% of patients had missing data on at least one of the CCPS-I subscale items. To minimize bias and maximize cases in the analyses, we used a model-based multiple imputation procedure, which provides more efficient, accurate, and reliable inferences than ad hoc methods.<sup>29</sup> Missing data were imputed separately for patients in inpatient/residential and outpatient programs. All analyses used 5 imputed datasets.

## RESULTS

### Inpatient/Residential and Outpatient Subgroup Characteristics

Comparisons of patients treated in inpatient/residential versus outpatient programs (Table 1) showed that outpatients



**TABLE 1.** Descriptive Statistics for Inpatient/Residential and Outpatient Subsamples

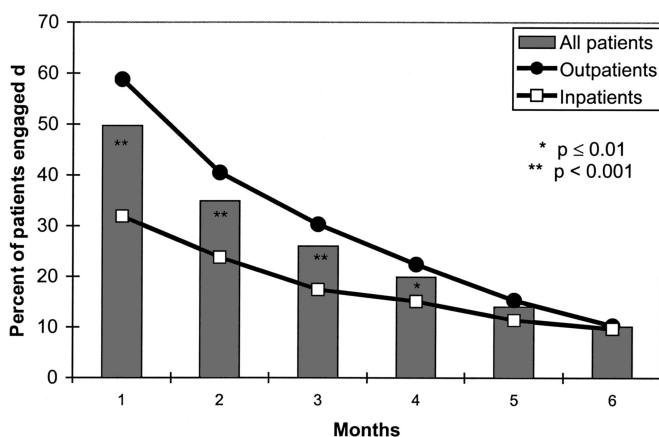
	Outpatients (n = 580)		Inpatients (n = 298)	
	Mean	Standard Deviation	Mean	Standard Deviation
Demographics				
Age (yr)	47.46	7.68	47.36	8.60
Years of education	12.90	1.93	12.63	2.04
Is married	0.17	0.38	0.15	0.35
Is nonwhite*	0.52	0.50	0.40	0.49
Patient factors				
Intake ASI alcohol index	0.47	0.29	0.48	0.29
Intake ASI drug index	0.13	0.13	0.12	0.13
Dual diagnosis†	0.29	0.57	0.47	0.50
Motivation	2.54	0.81	2.56	0.87
Treatment factors				
Prior SUD/psychiatric visit in last year*	0.82	0.38	0.72	0.45
Completed treatment	0.85	0.36	0.85	0.36
Treatment intensity	3.90	1.98	4.14	2.36
CCPS-I scores‡				
Coordinate care†	2.92	1.92	2.05	1.96
Connect to resources	3.92	2.39	3.60	2.14
Maintain contact†	5.11	3.82	3.74	4.13
Provider continuity	0.97	0.83	0.89	0.73
Continuing care outcome				
Engagement in continuing care (mo)*	1.65	2.00	1.02	1.87

\* $P \leq 0.001$ , † $P \leq 0.0001$ ; to adjust for multiple  $t$  tests, the  $P$  value was set at  $P \leq 0.003$  (05/16).

‡The possible ranges of CCPS-I subscale scores are: coordinate care 0–5; connect to resources 0–7; maintain contact 0–12; provider continuity 0–2.

ASI indicates Addiction Severity Index; SUD, substance use disorder; CCPS-I, individual-level Continuity of Care Practices Survey.

were more likely to be nonwhite (52% vs. 40%) but less likely to have dual diagnoses (29% vs. 47%). Outpatients also were more likely than inpatients (82% vs. 72%) to have had

**FIGURE 1.** Percent of patients in inpatient/residential and outpatient substance use disorder programs who had 2 or more continuing care visits by months after discharge.

at least one SUD or psychiatric clinic visit in the year before intensive treatment. Outpatients received more coordinated care, and staff made more efforts to maintain contact with outpatients than did staff in inpatient/residential programs. Outpatients also engaged in continuing care longer than did patients treated in inpatient/residential programs (1.65 months vs. 1.02 months). These differences led us to conduct separate analyses for these patient subgroups in all subsequent analyses.

Figure 1 demonstrates striking differences in the percentage of inpatients and outpatients who engaged in continuing care. In the first month after discharge, 59% of patients from outpatient programs made at least 2 continuing care visits compared with only 32% for patients from inpatient/residential programs. Three months after discharge, differences narrowed, with 30% of outpatients engaging in continuing care and 17% of inpatients doing so. Only 10% of patients in both groups remained engaged in continuing care 6 months after intensive treatment.

Inpatient admissions were uncommon and accounted for few interruptions in engagement in continuing care. Three months after discharge, only 8% of patients had an inpatient admission; by 6 months, 12% had been admitted.

## Continuity of Care Practices and Engagement Correlations

Intercorrelations (Table 2) among the 4 CCPS-I subscales were moderate and ranged from 0.32 to 0.57 among outpatients and from 0.43 to 0.73 among inpatients. Positive associations among subscales were expected. Intercorrelations also were somewhat stronger among the inpatients compared with the outpatients, suggesting more overlap across subscales for inpatients compared with outpatients.

Correlations between the CCPS-I subscales and outpatients' engagement in continuing care were significant and moderately correlated, ranging from 0.19 for maintain contact to 0.31 for coordinate care. In contrast, corresponding correlations between the CCPS-I subscales and inpatients' engagement in continuing care were not significant and ranged from 0.00 for maintain contact to 0.09 for coordinate care and connect to resources. This preliminary examination suggests that continuity of care practices were more strongly associated with engagement in care among outpatients than inpatients.

## Predictors of Substance Use Disorders Patients' Consistent Engagement in Continuing Care

It is important to control for factors affecting selection of continuing care when evaluating the role of continuity of care practices in fostering continuing care. Table 3 displays estimated mixed-effects regression coefficients for each set of predictors entered simultaneously on length of engagement in continuing care among patients treated in outpatient programs. Three of the 4 CCPS-I subscales significantly predicted outpatients' length of engagement in care, with the strongest effect being for provider continuity (0.25). Patients treated in outpatient programs where staff ensured more provider continuity remained in continuing care longer. A one-point increase on provider continuity corresponds to a

**TABLE 2.** Intercorrelations of Individual-Level Continuity of Care Practices Survey Subscales and Engagement in Continuing Care for Inpatient/Residential and Outpatient Substance Use Disorder Programs

	Coordinate Care	Connect to Resources	Maintain Contact	Provider Continuity	Engagement in Continuing Care
Coordinate care	—	0.73*	0.75*	0.57*	0.09
Connect to resources	0.35*	—	0.64*	0.43*	0.09
Maintain contact	0.46*	0.51*	—	0.53*	0.00
Provider continuity	0.32*	0.49*	0.57*	—	0.02
Engagement in continuing care	0.31*	0.21*	0.19*	0.22*	—

\*Correlations for patients treated in inpatient/residential programs are above the diagonal; correlations for patients treated in outpatient programs are below the diagonal. To adjust for multiple correlations, the alpha level was set at  $P \leq 0.005$  (.05/10 for each sample).

28% increase in length of engagement, ie, a 25-day increase for patients who had been engaged in continuing care for 3 months. Patients treated in outpatient programs where staff provided more coordinated care and made more efforts to connect patients to resources also were more likely to participate in continuing care for a longer time.

Patient and prior treatment factors also were significant predictors of outpatients' engagement in care. In all 4 models, patients with more alcohol-related problems at intake engaged in less continuing care, whereas patients who staff

perceived as more motivated at discharge engaged in more continuing care. Additionally, patients with at least one SUD or psychiatric clinic visit in the year before intensive treatment and those who completed treatment engaged in continuing care for a longer time.

Mixed-effects regression analyses similar to those presented in Table 3 were conducted on the subsample of patients treated in inpatient/residential programs. These analyses (Table 4) produced distinctly different results; continuity of care practices were not significant predictors of inpatients'

**TABLE 3.** Mixed-Model Regression Coefficients for Continuity of Care Practices Predicting Engagement in Continuing Care for Patients (n = 580) Treated in Outpatient Substance Use Disorder (SUD) Programs

	Effect Estimates for Predictors of Engagement			
	Model 1	Model 2	Model 3	Model 4
<b>Demographics</b>				
Age (yr)	0.01 (0.00, 0.02)*	0.01 (−0.01, 0.02)	0.00 (−0.01, 0.02)	0.00 (−0.01, 0.02)
Education (yr)	0.03 (−0.01, 0.07)	0.02 (0.00, 0.07)	0.04 (0.00, 0.07)	0.04 (0.00, 0.08)
Married (yes = 1)	−0.01 (−0.23, 0.20)	−0.02 (−0.24, 0.20)	−0.03 (−0.25, 0.19)	−0.02 (−0.24, 0.19)
Nonwhite (yes = 1)	−0.02 (−0.21, 0.15)	0.00 (−0.19, 0.18)	−0.02 (−0.20, 0.16)	−0.04 (−0.22, 0.15)
<b>Patient factors</b>				
Intake ASI alcohol index	−0.42 <sup>†</sup> (−0.69, −0.15)	−0.43 <sup>†</sup> (−0.71, −0.17)	−0.43 <sup>†</sup> (−0.69, −0.16)	−0.41 <sup>†</sup> (−0.67, −0.14)
Intake ASI drug index	0.29 (−0.33, 0.91)	0.32 (−0.31, 0.94)	0.42 (−0.20, 1.05)	0.42 (−0.21, 1.04)
Dual diagnosis (yes = 1)	0.02 (−0.16, 0.20)	0.00 (−0.18, 0.19)	0.03 (−0.15, 0.21)	0.05 (−0.14, 0.23)
Motivation	0.19 <sup>‡</sup> (0.08, 0.30)	0.20 <sup>‡</sup> (0.09, 0.31)	0.18 <sup>‡</sup> (0.07, 0.30)	0.21 <sup>‡</sup> (0.10, 0.32)
<b>Treatment factors</b>				
SUD/psychiatric visit before treatment	0.40 <sup>†</sup> (0.15, 0.65)	0.39 <sup>†</sup> (0.13, 0.64)	0.42 <sup>†</sup> (0.17, 0.67)	0.39 <sup>†</sup> (0.13, 0.64)
Completed treatment (yes = 1)	0.57 <sup>†</sup> (0.20, 0.93)	0.53 <sup>†</sup> (0.17, 0.90)	0.65 <sup>‡</sup> (0.30, 1.02)	0.59 <sup>†</sup> (0.23, 0.94)
No. therapy sessions/d	−0.01 (−0.05, 0.03)	−0.01 (−0.06, 0.03)	0.00 (−0.04, 0.04)	0.01 (−0.03, 0.06)
<b>Continuity of care practices</b>				
Coordinate care (model 1)	0.11 <sup>‡</sup> (0.05, 0.16)			
Connect to resources (model 2)		0.11 <sup>‡</sup> (0.05, 0.16)		
Maintain contact (model 3)			0.04 (0.01, 0.07)	
Provider continuity (model 4)				0.25 <sup>‡</sup> (0.09, 0.41)
Intercept	−1.96 (−3.21, −0.72)	−2.00 (−3.25, −0.74)	−2.06 (−3.33, −0.80)	−1.96 (−3.20, −0.73)
AIC of full model	1652	1650	1652	1656
Pseudo- $R^2$	0.24	0.23	0.22	0.22

\*Numbers in parentheses are the 95% confidence intervals.

<sup>†</sup> $P \leq 0.01$ ; <sup>‡</sup> $P \leq 0.001$ ; to adjust for multiple tests of the effect of each of 4 subscales on engagement, the alpha level was set at  $P \leq 0.01$  (0.05/4).

The intraclass correlation (ICC) for the unconditional means model (no predictors) = 0.04 for outpatients. Akaike's Information Criterion (AIC)<sup>31</sup> for the unconditional means model was 1662.9.

Pseudo- $R^2$  was calculated by squaring the sample correlation between observed and predicted values.<sup>32</sup> As such, it is a measure of the total outcome variation "explained" by the model.

ASI indicates Addiction Severity Index.

**TABLE 4.** Mixed-Model Regression Coefficients for Continuity of Care Practices Predicting Engagement in Continuing Care for Patients (n = 298) Treated in Inpatient/Residential Substance Use Disorder (SUD) Programs

	Effect Estimates for Predictors			
	Model 1	Model 2	Model 3	Model 4
<b>Demographics</b>				
Age (yr)	0.02 <sup>†</sup> (0.01, 0.04)*	0.03 (0.01, 0.04)	0.03 <sup>†</sup> (0.01, 0.04)	0.03 <sup>†</sup> (0.01, 0.04)
Education (yr)	0.02 (−0.05, 0.08)	0.01 (−0.05, 0.08)	0.02 (−0.05, 0.08)	0.02 (−0.05, 0.09)
Married (yes = 1)	0.13 (−0.23, 0.50)	0.10 (−0.27, 0.48)	0.13 (−0.25, 0.51)	0.11 (−0.26, 0.49)
Nonwhite (yes = 1)	−0.04 (−0.37, 0.30)	−0.04 (−0.38, 0.29)	−0.04 (−0.38, 0.30)	−0.04 (−0.38, 0.30)
<b>Patient factors</b>				
Intake ASI alcohol index	−0.07 (−0.63, 0.48)	−0.12 (−0.68, 0.44)	−0.09 (−0.66, 0.47)	−0.07 (−0.63, 0.48)
Intake ASI drug index	−0.66 (−1.83, 0.50)	−0.61 (−1.77, 0.54)	−0.58 (−1.78, 0.62)	−0.56 (−1.72, 0.60)
Dual diagnosis (yes = 1)	0.22 (−0.07, 0.52)	0.23 (−0.07, 0.52)	0.21 (−0.09, 0.52)	0.22 (−0.08, 0.52)
Motivation	0.18 <sup>†</sup> (0.01, 0.35)	0.17 (0.00, 0.34)	0.20 (0.01, 0.38)	0.21 <sup>†</sup> (0.04, 0.39)
<b>Treatment factors</b>				
SUD/psychiatric visit before treatment	0.36 (0.01, 0.71)	0.37 (0.02, 0.72)	0.36 (0.00, 0.71)	0.34 (−0.02, 0.70)
Completed treatment (yes = 1)	0.07 (−0.43, 0.58)	0.06 (−0.44, 0.57)	0.09 (−0.43, 0.60)	0.11 (−0.40, 0.61)
No. therapy sessions/d	−0.08 (−0.18, 0.01)	−0.07 (−0.17, 0.03)	−0.08 (0.18, 0.02)	−0.08 (−0.18, 0.02)
<b>Continuity of care practices</b>				
Coordinate care (model 1)	0.08 (−0.02, 0.17)			
Connect to resources (model 2)		0.08 (−0.01, 0.17)		
Maintain contact (model 3)			0.02 (−0.05, 0.09)	
Provider continuity (model 4)				0.15 (−0.12, 0.42)
Intercept	−2.25 (−3.84, −0.21)	−2.21 (−4.02, −0.39)	−2.06 (−3.90, −0.21)	−2.15 (−3.99, −0.32)
AIC of full model	1048	1050	1049	1048
Pseudo- <i>R</i> <sup>2</sup>	0.33	0.29	0.32	0.31

\*Numbers in parentheses are the 95% confidence intervals.

<sup>†</sup>*P* ≤ 0.01; to adjust for multiple tests of the effect of each of 4 subscales on engagement, the alpha level was set at *P* ≤ 0.01 (.05/4).

The intraclass correlation (ICC) for the unconditional means model (no predictors) = 0.15 for inpatients. Akaike's Information Criterion (AIC)<sup>31</sup> for the unconditional means model was 1052.

Pseudo-*R*<sup>2</sup> was calculated by squaring the sample correlation between observed and predicted values.<sup>32</sup> As such, it is a measure of the total outcome variation "explained" by the model.

ASI indicates Addiction Severity Index.

length of engagement in continuing care in any of the models although all effects were consistently positive. Moreover, few other factors were significantly related to patients' engagement in continuing care. The pattern of effects suggest that older and more motivated patients engaged in more continuing care, with significant effects on 3 of the 4 models for age and 2 of the 4 models for motivation.

## DISCUSSION

One challenge facing SUD treatment staff is finding ways to increase patients' participation in continuing care. This study demonstrates that patients treated in outpatient SUD programs who received more continuity of care engaged in continuing care for a longer time. In light of the current trend to provide SUD treatment primarily in outpatient settings, our findings that staff practices (such as coordinating care among providers, trying to connect patients to community resources, maintaining contact with them over time, and ensuring continuity in providers) increased patients' retention in treatment are especially important. Program managers should support and encourage outpatient staff's use of these practices because they had a positive impact on patients' engagement in continuing care, which, in turn, may help patients sustain treatment gains and improve their outcomes.

More highly motivated outpatients and those with fewer alcohol problems at treatment entry, as well as patients who completed treatment or used VA mental health services in the year before intensive treatment, also remained in continuing care longer. Among inpatients, only the motivation finding held (significant for 2 models). These findings underscore the importance of finding ways to enhance patients' motivation and ensure treatment completion. Additionally, older inpatients remained in continuing care longer (significant for 3 models), suggesting that age may be a proxy for more maturity, which might contribute to increased engagement.

Several factors may explain subgroup differences. First, inpatient/residential programs provided significantly less continuity of care than outpatient programs with regard to coordination of care and maintaining contact with patients. Mean scores for provider continuity and connecting patients to resources also were lower (but not significantly different) for inpatient/residential programs. It is possible that inpatient/residential program staff do not believe that continuing care is as important as do intensive outpatient program staff. Staff in inpatient/residential programs may be more likely to presume that patients receive a sufficient dose of treatment while in these programs; thus, they may be less inclined to initiate continuity of care practices.

Second, structural aspects of inpatient/residential programs may contribute to the lack of impact of continuity of care practices on patients' engagement in continuing care. Transitions from inpatient treatment to continuing care are likely to be characterized by more discontinuities and abruptness than transitions from intensive outpatient treatment to continuing care. At the conclusion of treatment, patients in inpatient/residential programs move from a relatively sheltered treatment milieu back to the "real" world and into an outpatient program with which they may have had little or no contact. These aspects of inpatient/residential programs present potential barriers to inpatients' engagement in continuing care. Outpatients may be less likely to confront these barriers because for many of them, continuing care occurs in the same program as their intensive treatment. The transition to continuing care is smoother because programs may be structured so that patients gradually step down from intensive outpatient visits to less frequent continuing care visits.

Third, inpatient models may not predict engagement because they do not include variables related to patients' access to continuing care. Patients who are residentially unstable or who live far from a treatment program may be more likely to be admitted to inpatient/residential programs. Longer travel distance to treatment has been linked to less likelihood of completing SUD treatment and a shorter length of stay.<sup>33</sup> In addition, lack of geographic access to continuing care clinics has been shown to be a barrier to participation in continuing care for patients treated in VA inpatient SUD programs.<sup>34</sup> Transportation problems, homelessness, and frequent moves also create barriers to patients' engagement in care. Moreover, staff attempts to maintain contact with patients (eg, sending appointment reminders) may be unproductive if patients lack a consistent mailing address. Finally, staff's efforts to connect patients to resources in distant communities may be hampered because SUD program staff lack well-established working relationships with staff at distant agencies and thus may not be able to effectively match patients to resources and providers. Telephone-based monitoring and counseling interventions mitigate some access barriers. Moreover, these interventions have produced better alcohol use outcomes among patients with alcohol dependence than relapse prevention or 12-step group counseling.<sup>35</sup>

Final factors that may account, in part, for lack of significant effects of continuity of care practices on inpatients' engagement in continuing care are the smaller number of patients in the inpatient sample compared with the outpatient sample (298 vs. 580) and the higher intraclass correlation in the inpatient sample. Each of these factors results in less statistical power to detect a hypothesized direct effect for inpatients. Inpatient sample results are inconclusive about whether there are effects for continuity of care practices on engagement in continuing care. Confidence intervals for the inpatient estimates include plausible values and a pattern of values consistent with those observed for the outpatient sample. It is possible that continuity of care practices effects were just not detectable in the inpatient sample. A larger inpatient sample may have yielded significant positive effects

on engagement for 3 models: coordinate care, connect to resources, and provider continuity.

The current study is limited in that data on continuity of care practices and patient motivation are restricted to staff reports. Staff may have over- or underestimated the continuity of care practices they used with patients. Moreover, staff assessments of patients' motivation may have been biased by factors such as patients' past treatment failures or psychosocial problems (eg, homelessness). Another limitation is that we lacked provider data needed to control for clustering of patients at the provider level in our mixed-effects analyses. Finally, this study was conducted only in VA SUD treatment programs and men comprised 98% of the patient sample. Consequently, care must be used in generalizing findings to non-VA treatment programs, where patient populations, program structures, and clinical practices may differ from VA facilities.

These limitations are balanced by the fact that this study examined a large, diverse sample of intensive SUD treatment programs. To our knowledge, this is the first large-scale multisite study to examine the links between specific continuity of care practices that staff initiated with patients and their engagement in continuing care. Mixed-effects regression analyses and multiple imputation methods were used to minimize bias as a result of clustering of patients within programs and missing data, thus enhancing our findings' accuracy.

Further research is needed to identify factors that predict engagement in continuing care, especially for patients treated in inpatient/residential programs. More complex models that incorporate factors such as barriers patients confront in accessing continuing care and the nature of provider and patient relationships are needed, as well as analyses that account for provider effects. Other promising avenues for research include examining the relationship between self-help group participation and engagement in continuing care, and determining the minimum amount of continuity of care or the optimal combination of continuity of care practices necessary to effect inpatients' engagement in continuing care. Most importantly, studies are needed to determine whether continuity of care practices, as mediated by engagement in continuing care, have an impact on patients' symptom and functioning outcomes.

## ACKNOWLEDGMENTS

*John Finney, Sonne Lemke, Rudolf Moos, and Christine Timko provided helpful comments on earlier drafts of this paper. The authors are grateful to the program directors, coordinators, and staff of participating VA SUD treatment programs and to Jill Andrassy, Zoe Gillispie, Brandy Henson, Kate Onstott, Gingi Pica, Katrina Reyes, Jacob Robson, Carla Rodas, and Amy Powers for their help with data collection.*

## REFERENCES

1. Department of Veterans Affairs/Substance Use Disorders (SUD) Clinical Practice Guidelines [Office of Quality and Performance web site]. Available at: [http://www.oqp.med.va.gov/cpg/SUD/SUD\\_Base.htm](http://www.oqp.med.va.gov/cpg/SUD/SUD_Base.htm). Accessed July 9, 2004.



2. American Psychiatric Association. Practice guidelines for the treatment of patients with substance use disorders: alcohol, cocaine, opioids. *Am J Psychiatry*. 1995;Suppl 11:1–80.
3. Walker RD, Donovan DM, Kivlahan DR, et al. Length of stay, neuropsychological performance, and aftercare: influences on alcoholism treatment outcome. *J Consult Clin Psychol*. 1983;51:900–911.
4. Gilbert FS. The effect of type of aftercare follow-up on treatment outcome among alcoholics. *J Stud Alcohol*. 1988;49:149–159.
5. Ito JR, Donovan DM. Predicting drinking outcome: demography, chronicity, coping and aftercare. *Addict Behav*. 1990;15:553–559.
6. Peterson KA, Swindle RW, Phibbs CS, et al. Determinants of readmission following inpatient substance abuse treatment: a national study of VA programs. *Med Care*. 1994;32:535–550.
7. Steenbarger BN. Duration and outcome in psychotherapy: an integrative review. *Prof Psychol Res Practice*. 1994;25:111–119.
8. Ouimette PC, Moos RH, Finney JW. Influence of outpatient treatment and 12-step group involvement on one-year substance abuse treatment outcomes. *J Stud Alcohol*. 1998;59:513–522.
9. Moos R, Schaefer J, Andrassy J, et al. Outpatient mental health care, self-help groups, and patients' one-year treatment outcomes. *J Clin Psychol*. 2001;57:273–287.
10. Ritscher J, Finney J, Moos R. The influence of treatment orientation and continuing care on substance abuse patients' two-year remission. *Psychiatr Serv*. 2002;53:595–601.
11. Sannibale C, Hurkett E, Van Den Bossche D, et al. Aftercare attendance and post-treatment functioning of severely substance dependent residential treatment clients. *Drug Alcohol Rev*. 2003;22:181–190.
12. McKay JR, McLellan AT, Alterman AI, et al. Predictors of participation in aftercare sessions and self-help groups following completion of intensive outpatient treatment for substance abuse. *J Stud Alcohol*. 1998;59:152–162.
13. Lie C, McKellar JD. *VA Care for Substance Use Disorder Patients: Indicators of Facility and VISN Performance (Fiscal Years 2001 and 2002)*. Palo Alto, CA: Veterans Affairs Palo Alto Health Care System, Program Evaluation and Resource Center and Center for Health Care Evaluation; 2003.
14. Veterans Health Administration. FY2003 VHA Executive Career Field Network Director Performance Measurement System and JCAHO Hospital Core Measure, Technical Manual [Office of Quality and Performance web site]. Available at: <http://vaww.opq.med.va.gov>. Accessed July 9, 2004.
15. Donovan DM. Continuing care: promoting the maintenance of change. In: Miller WR, Heather N, eds. *Treating Addictive Behaviors*. New York: Plenum; 1998:317–336.
16. Lash SJ. Increasing participation in substance abuse aftercare treatment. *Am J Drug Alcohol Abuse*. 1998;24:31–36.
17. Lash SJ, Blosser SL. Increasing adherence to substance abuse aftercare group therapy. *J Subst Abuse Treat*. 1999;16:55–60.
18. Lash SJ, Petersen GE, O'Connor EA Jr, et al. Social reinforcement of substance abuse aftercare group therapy attendance. *J Subst Abuse Treat*. 2001;20:3–8.
19. Lash SJ, Burden JL, Monteleone BR, et al. Social reinforcement of substance abuse treatment aftercare participation: impact on outcome. *Addict Behav*. 2004;29:337–342.
20. Bachrach LL. Continuity of care for chronic mental patients: a conceptual analysis. *Am J Psychiatry*. 1981;138:1449–1456.
21. Haggerty J, Reid R, McGrail K, et al. *Here There and All Over the Place: Defining and Measuring Continuity of Health Care*. British Columbia: Center for Health Services and Policy Research, Health Policy Research Unit, University of British Columbia; 2001.
22. Johnson S, Prosser D, Bindman J, et al. Continuity of care for the severely mentally ill: concepts and measures. *Soc Psychiatry Psychiatr Epidemiol*. 1997;2:137–142.
23. Ware NC, Tugenberg T, Dickey B, et al. An ethnographic study of the meaning of continuity of care in mental health services. *Psychiatr Serv*. 1998;50:395–400.
24. Schaefer JA, Cronkite R, Ingudomnukul E. Assessing continuity of care practices in substance use disorder treatment programs. *J Stud Alcohol*. 2004;65:513–520.
25. McLellan AT, Kushner H, Metzger D, et al. The fifth edition of the Addiction Severity Index. *J Subst Abuse Treat*. 1992;9:99–213.
26. *International Classification of Diseases*, 9th Revision, Clinical Modification (ICD-9-CM). Dover, DE: American Medical Association; 1999.
27. R Development Core Team. *A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing; 2005. Available at: <http://www.R-project.org>. Accessed June 27, 2005.
28. Venables WN, Ripley BD. *Modern Applied Statistics and S*. New York: Springer; 2002.
29. Schafer JL. *Analysis of Incomplete Multivariate Data*. New York: Chapman & Hall; 1997.
30. Schafer JL, Graham JW. Missing data: our view of the state of the art. *Psychol Methods*. 2002;7:147–177.
31. Akaike H. Information theory as an extension of the maximum likelihood principle. In: Petrov BN, Csaki F, eds. *Second International Symposium on Information Theory*. Budapest: Akademiai Kiado; 1973:267–278.
32. Singer JD, Willett JB. *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence*. London: Oxford University Press; 2003.
33. Schmitt SK, Phibbs CS, Piette JD. The influence of distance on utilization of outpatient mental health aftercare following inpatient substance abuse treatment. *Addict Behav*. 2003;28:1183–1192.
34. Beardsley K, Wish ED, Fitzelle DB, et al. Distance traveled to outpatient drug treatment and client retention. *J Subst Abuse Treat*. 2003;25:279–285.
35. McKay JR, Lynch KG, Shepard DS, et al. The effectiveness of telephone-based continuing care in the clinical management of alcohol and cocaine use disorders: 12-month outcomes. *J Consult Clin Psychol*. 2004;72:967–979.